REMARKS / ARGUMENTS

For the convenience of the Examiner and clarity of purpose, Applicant has reprinted the substance of the Office Action in ***10-point bolded and italicized font.*** Applicant's arguments immediately follow in regular font.

2. Claims 1-7, 4-7, 10-11, 13, 15-17, 20-24, and 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ence et al (US 6581451).

3. Ence et al. shows a density measuring device for measuring fluid flowing in the bore of a straight horizontal pipeline including inlet and outlet pipes 6, and a second pipe 4 connected at each end to the inlet and outlet pipes via flexible couplings 2. Pipe 4 rests on a weight-measuring unit capable of measuring the weight of the second pipe, where the weight-measuring unit can include a load cell. It would have been obvious to one of ordinary skill in the art to use the device of Ence et al to measure the density of any fluid flowing through the density measurement device.

4. Regarding claims 15 and 23—24, although Ence et al doesn't specifically use the term "control unit" for the device 20, it is stated that "the density of the material being transported may be determined by measuring the weight of duct segment 4 with and without material in the airflow" (i.e., fluid). See column 3 lines 26—30. It is also stated at the top of column 4 that to determine the density of material flowing in the pipeline, material-free fluid is transported through duct segment 4 and weighed, and recorded, and then material is introduced into the fluid and reweighed. The difference between the weights is then determined. Thus, if not anticipated as inherent that element 20 constitutes a control unit capable of performing the above mentioned operation, it would have been clearly obvious to one of ordinary skill in the art to record the weights in a computer to perform the subtraction and density determining steps.

5. Regarding claims 4, 13, and 22, although Ence et al does not specifically state that the cross—sectional area is uniform, one viewing Figure 1 would interpret the cross-sectional area to be uniform, or obvious to use a uniform pipe cut out of a standard uniform pipe to save costs.

6. Regarding claims 7 and 17, the statement that "scale" 20 supports the weight of pipe 4 and measures the weight with a load cell makes obvious, if not inherent, that the load cell is of the compression type.

7. Regarding claims 27-34, the antecedent fluid of the parent claims is an intended use, and is therefore not regarded as structurally limiting the measurement device claimed in the parent claims. Therefore, the named fluid is not regarded as other than a statement of intended use in these claims, and in any event, it would have been obvious to one of ordinary skill in the art to use the device to measure the density of any kind of fluid passing therethrough.

> ***8. Claims 8—9, 12, 14, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ence et al as applied to claims 1—7, 10-11, 13, 15—17 and 20—24 above, and further in view of Ford et al (US-4817428)***
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> ***9. Ence et al lacks a teaching of a weight—measuring unit positioned above the second pipe to measure weight via a tension-type load cell, or a second pipe that is curved and not uniform in cross section. However, Ford et al shows a density-measuring device where the pipe section being weighed is curved and has a non-uniform cross section. It further shows a load cell above the pipe to measure tension in line 4.***
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> ***10. It would have been obvious to one of ordinary skill in the art to modify the pipe section 4 of Ence et al to be curved and of non-uniform cross section as taught in Ford et al, since the shape, size and uniformity are not critical to the measurement, so long as the volume of the section being weighed for density measurement is known. Further, it would have been obvious to substitute the tension—type load cell of Ford et al for the compression type of Ence et al as both are known equivalents for determining the same function.***
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> ***11. Claims 25 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ence et al as applied to claim 23 above, and further in view of Carlson (US-6007227) plus Heine et al (US-4285239).***
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> ***12. Ence et al lack a specific teaching of measuring the density while the fluid is in a process pipe on a shipping vessel or truck..***
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> ***13. However, Carlson teaches to measure density of a fluid being processed in a truck-mounted blender, where the densitometer is a nuclear density meter, and Heine et al teaches that a density meter having a weighed pipe section flexibly coupled in a pipeline may be a substitute for a nuclear density meter.***
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> ***14. Therefore, it would have been obvious to use the density meter of Ence et al as a substitute for the nuclear density meter in Carlson et al on a blender truck as motivated by Heine et al.***

As Applicant has argued in previous papers, Applicant does not agree with the Examiner's characterization of what *Ence* discloses or teaches or with the application of *Ence* to the previously pending claims. Nonetheless, Applicant has chosen to cancel without prejudice previously pending claims 1-34. The rejections presented above are, therefore, rendered moot.

NEW CLAIMS

Applicant has canceled the previously presented claims without prejudice and now presents new claims 35 through 68. Independent apparatus and system claims 35, 41 and 53 are directed to an embodiment of the disclosed invention in which the density of the fluid is controlled or adjusted based on a density determination made by the apparatus. Independent method claim 63 is directed to a process for controlling the density of a fluid in similar fashion. Support for these new independent claims may be found in the original claims and specification, as filed. Specific support for the aspect of controlling the density of the fluid being monitored before it is pumped into a well can be found in the specification as filed on page 2, lines 5-7, and on page 3, lines 11-14, as well as in other places throughout the specification. Applicant contends that none of the newly-submitted claims constitute the addition of new matter.

In contrast to new independent claims 35, 41, 53 and 63, *Ence* is directed to a device and methods for measuring the density of materials in a conveying system, especially as it relates to the blowing of insulation materials into walls or a space within a building. The device and methods of *Ence* are specifically directed to a device for measuring of density of the conveyed fluid to determine how much material (fluid) was delivered. Indeed, *Ence* specifically points out that his invention alleviates the uncertainty of guessing how much insulation was blown into a space (*see*, col. 2, ll. 1-9). The *Ence* device and methods supposedly determine how much insulation material has been added, so as to not exceed the holding capacity of a wall space, or so as to more accurately determine how much to charge based upon the amount of insulation used.

In no form or fashion does *Ence* disclose or teach that his invention can be used to control or adjust the density of the conveyed fluid (insulation) based on a measured density. In fact, *Ence* makes no mention or suggestion that his system is used, or could be used, to control or adjust the density of a material based upon its measured density before it is conveyed through the system to its destination.

Further, the structure and methods disclosed by *Ence* are significantly different from the structure and methods disclosed and claimed in the subject application. One of the more notable differences is that the subject invention discloses a device and method for measuring the density of relatively dense, heavy mixtures, such as proppant-containing fracturing fluids and cementitious slurries, for use in oil or gas wells and operations related thereto. *Ence* neither discloses nor teaches the desirability of measuring the density of such mixtures. Instead, *Ence* teaches a device and method for measuring the density of high-volume, low-weight insulation materials being applied via blowing or spraying. See *Ence*, col. 1, ll 13-25; col. 2, ln 65 to col. 3, ln 15.

CONCLUSION

Of the 34 original claims, claims 1-34 have been cancelled. Independent claims 35, 41, 53 and 63 have been added. Dependent claims 36-40, 42-52, 54-62 and 64-68 have been added. With this response, claims 35-68 are now pending.

The fees due for this paper include a three-month extension fee of $1,020. The Commissioner is authorized to charge this fee and any other fee that is necessary to make this and related papers timely and effective to Locke Liddell & Sapp LLP Deposit Account No. 12-1322, referencing matter number 020569-03100.

Applicant thanks the Examiner for his consideration and effort on this matter and submits that this application is now in condition for allowance. Applicant respectfully requests that a timely Notice of Allowance be issued in this case. The undersigned is available to discuss by telephone this amendment or any other matter pertaining to this file

Respectfully submitted,

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